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SMH/jj
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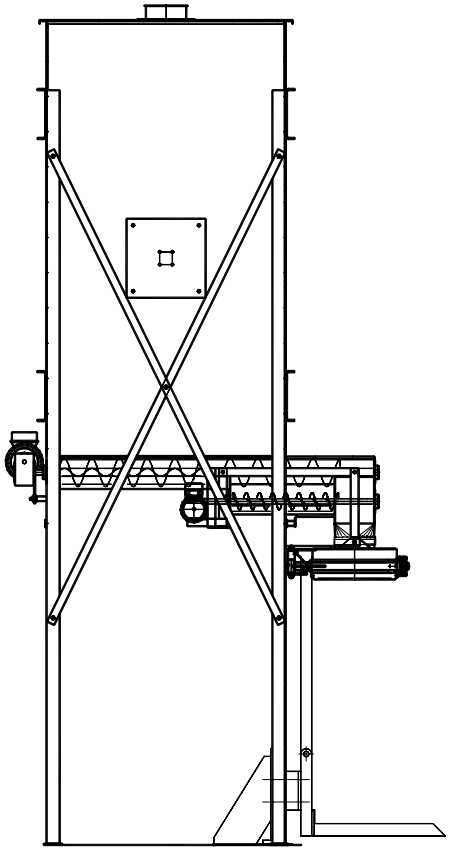
INSTRUCTION MANUAL

SACK WEIGHING SCALE S100



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3.0.0 WARNING

At any form of service of the weighing scale it should be ensured that the scale cannot be started during service. This is done by the operator switching off the power to the main switch and locking it with a key that is kept by the operator as long as the service takes place. Alternatively the operator should remove the fuses until service has been finalized.

El-installations **MUST** be carried out by an authorized electrician, and DS/EN60079-14 and DS/EN/60204-1 should be observed.

All regulations according to Atex zone 21 should be observed.

All local standards should be observed.

The bin of the scale may contain an atmosphere with danger of explosion in the form of a cloud of dust, for which reason equipment and components placed in the bin should be ex-marked for use in zone 21 according the harmonized standards DS/EN 50014, DS/EN 50281-1-1 and DS/EN 5050281-1-2.

In order to observe the harmonized standards regarding dust explosions DS/EN 1127-1 and DS/EN 13463-1 the cover of the proportioning bin should always be mounted.

The scale should not be used for weighing of other products than those mentioned in chapter 7.1 without previous consultation with the producer.

4.0.0 FUNCTIONAL DESCRIPTION

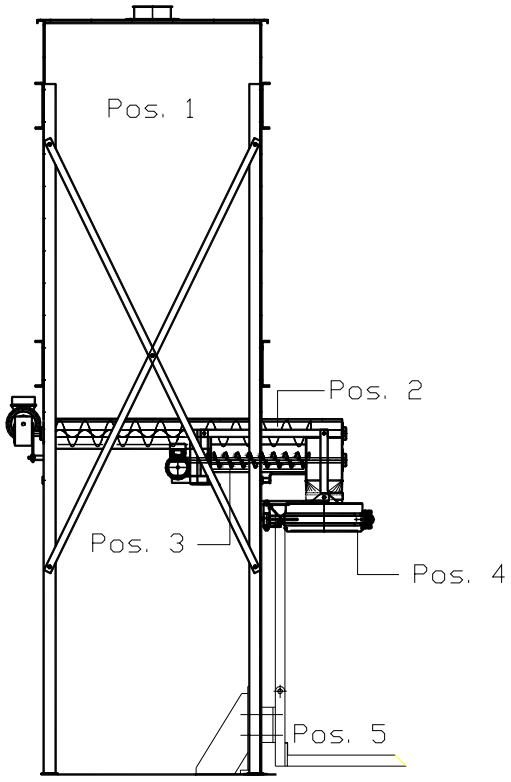


Fig. 1. Weighing scale

The weighing scale consists of a proportioning bin, pos. 1, a coarse proportioning auger, pos. 2, a fine proportioning auger, pos. 3, a sack holder, pos. 4, and a platform mounted on load cells, pos. 5, as well as a control box with weighing computer.

Material is added to the proportioning bin, pos. 1.

A sack is placed in the sack holder, pos. 4.

The proportioning is started by means of a foot pedal starting both proportioning augers, pos. 2 and 3. Weighing takes place in 2 steps. In step 1 a coarse proportioning is carried out where both augers operate until the value for coarse proportioning programmed is achieved. Then the fine proportioning auger continues alone until the weight required is achieved.

5.0.0 MOUNTING

5.1.0 Inspection of the Consignment

At receipt of the balance it should be checked that it has been delivered according to the detail specification.

5.2.0 Necessary Mounting Tools

- Hammer
- 1 set ring spanners
- Screwdriver
- Block level
- Drilling machine
- 10 mm concrete drill
- 1 set metal drills
- Diagonal cutter

5.3.0 Directions for Mounting

The balance should be placed on a stable floor without vibrations from other machines.

If there are vibrations in the equipment transporting material to the balance, a flexible connection should be mounted between the transport equipment and the balance.

Enabling the scale to operate correctly it is important that the weighing platform is placed correctly vertically beneath the auger outlet. Furthermore it is important that the platform can move freely without touching the legs of the proportioning bin or other construction materials.

The balance should be placed in a way that there is available space for placing of the sacks that have been weighed. Furthermore is should be carefully considered how the weighed sacks are removed from the weighing area.

5.4.0 Assembling the Bin

When mounting the scale start with assembling the proportioning bin. Bolt the bin together as shown on fig. 2.

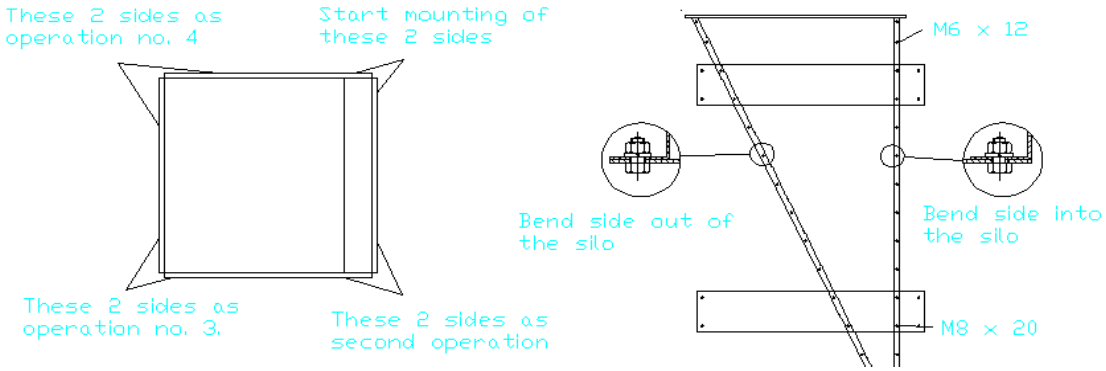

These 2 sides as operation no. 4
Start mounting of these 2 sides
These 2 sides as operation no. 3.
These 2 sides as second operation
M6 x 12
Bend side out of the silo
Bend side into the silo
M8 x 20

Fig. 2. Mounting the proportioning bin

Then bolt the legs onto the bin as shown on fig. 3.

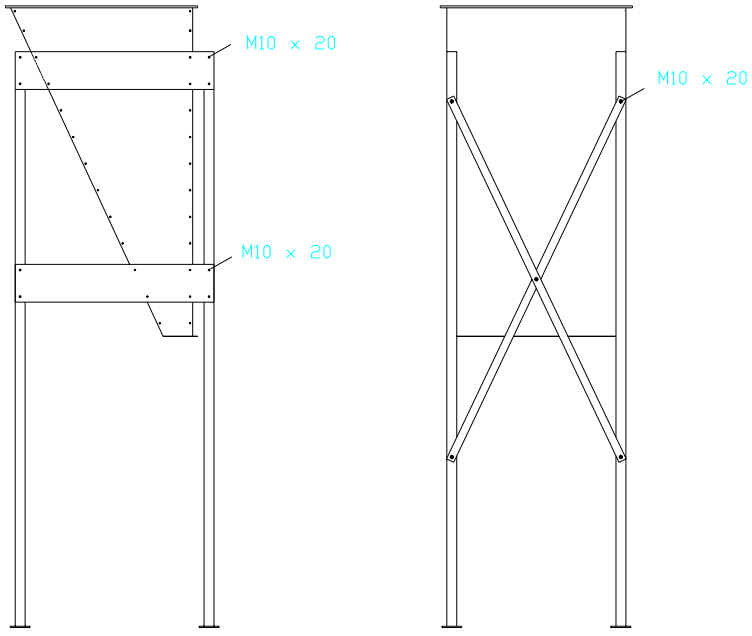


Fig. 3. Mounting the legs

5.5.0 Mounting of the Augers

The bin with legs can be set up, and the proportioning augers mounted.

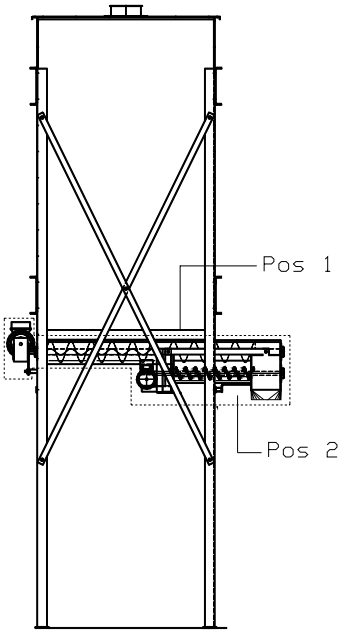


Fig. 4. Mounting of the augers

The augers are delivered preassembled in troughs as units, pos. 2, ready for bolting onto the flanges of the bin, pos. 1.

A tube of silicone sealant is included with the scale to be used for tightening of possible checks and cracks of the bin.

5.6.0 Mounting of the Weighing Platform

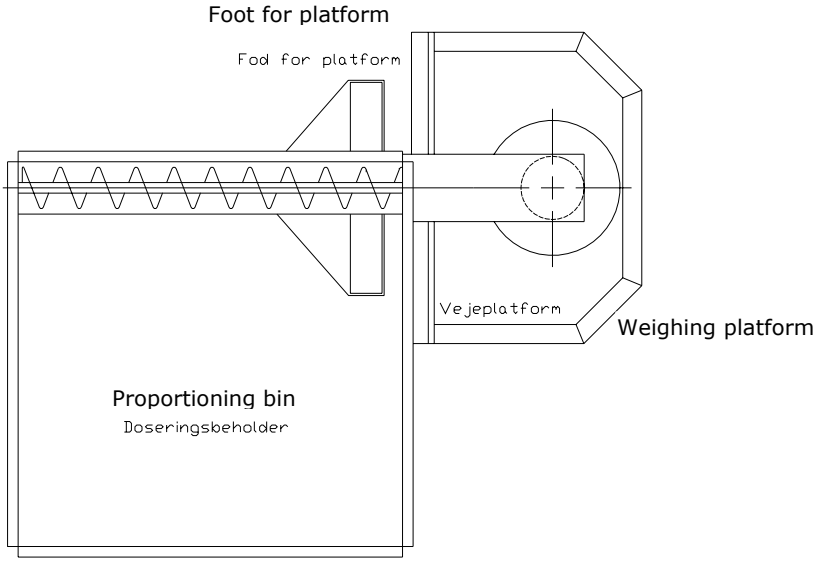


Fig. 5. Placing of platform

Place the platform in a way that the inlet is vertical beneath the outlet of the proportioning augers. Bolt the platform onto the floor and connect the in- and outlets with a flexible connection piece in filter bag material.

5.7.0 Connection of the Computer

Connection of cables and load cells appears from fig. 6.

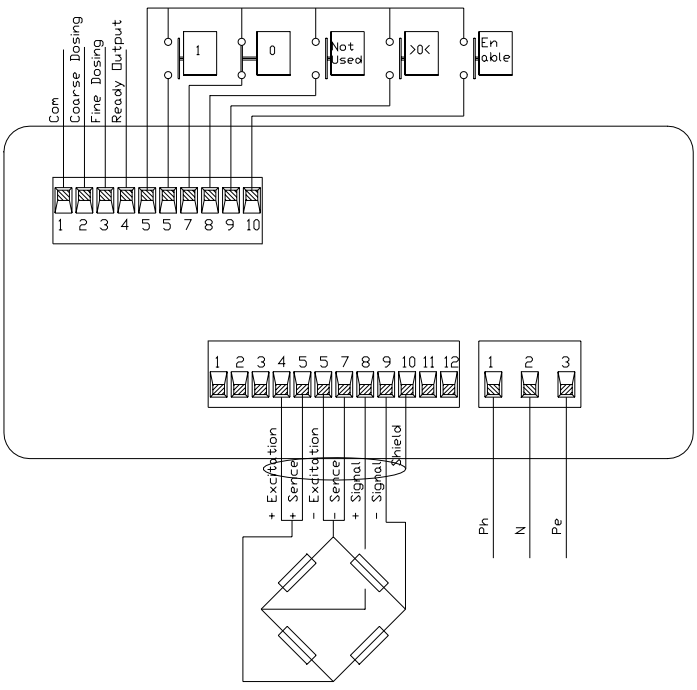


Fig. 6. Connection of computer

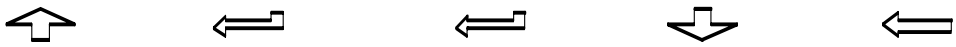
6.0.0 STARTING UP

6.1.0 Programming of the Computer

Before the sack weighing scale is taken into use, the computer should be programmed. From the factory a number of standard values has been programmed, but as the products to be weighed are different, it may be necessary to re-program some of the values. The values stated in the below text should be considered as examples of values that can be used for a large number of the materials for which the scale is normally used. The values should, however, be considered as a guide, and depending on products to be weighed, you can try to alter the values and thus optimize the weighing.

6.1.1 Password for Programming

To avoid that data are changed inadvertently or by persons without permission to do so, the computer should unlocked by means of the following code to be entered in sequence:



Programming of the code should be carried in correct sequence and within 7 seconds.

Important: In the following example on programming are stated values without decimal point.

The computer allows you to program a decimal point. If e.g. you want to read kg instead of g you insert a decimal point 3 decimal points from the right under point Ind 6. In cases where you insert a decimal point, values with corresponding decimal points should be programmed

Example:

At Ind 1 29999 is altered to 29.999
At Ind 2 12 is altered to 0,.012
At Ind 3 12 is altered to 0,.012

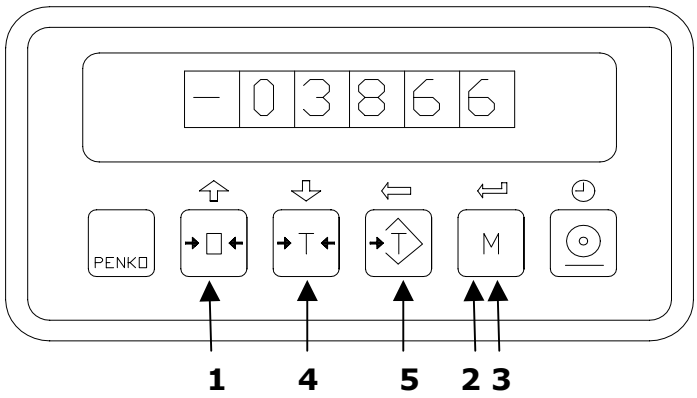
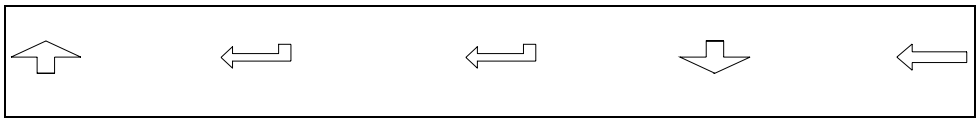


Fig. 7. Password for programming

6.1.2 Programming of Set Up Values

In the following is shown an example on programming of values matching most products.

To have access to altering of data, key in the code in the sequence stated within 7 seconds.



In the display the following text is shown: - - Ind

Enter "Arrow left" ⇦

The display shows the following text: - - Ind 1 (Max. display value)

Enter "Arrow left" ⇦

Press "29999" and then "Enter" ⇦

The new value has now been registered, and

The display shows the following text: - - Ind 2 (No motion band)

Enter "Arrow left" ⇦

Press "12" and then "Enter" ⇦

The display shows the following text: - - Ind 3 (Zero tracking band)

Enter "Arrow left" ⇦

Press "12" and then "Enter" ⇦

The display shows the following text: - - Ind 4 (Digital overall filter)

Enter "Arrow left" ⇦

Press "5" and then "Enter" ⇦

The display shows the following text: - - Ind 5 (Digital step size)

Enter "Arrow left" ⇦

Press "1" and then "Enter" ⇦

The display shows the following text: - - Ind 6 (Decimal point position)

Enter "Arrow left" ⇦

Now place the decimal point according to wish. If you insert a decimal point, the previously programmed values are automatically amended.

Then press ”Enter ⇦┘

The display shows the following text: - - Ind 7 (Display refreshment speed)

Press ”3” and then ”Enter” ⇦┘

The display shows the following text: - - Ind 8 (Industrial Certifed)

Enter ”Arrow left” ⇦

Press ”3” and then ”Enter” ⇦┘

The display shows the following text: - - Ind 9 (Sampling rate)

Enter ”Arrow left” ⇦

Press ”7” and then ”Enter” ⇦┘

The display shows the following text: - - Ind A (Stabilization time 1/10 sec.)

Enter ”Arrow left” ⇦

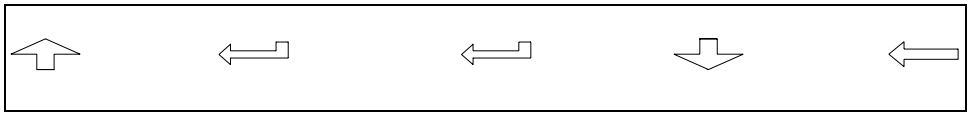
Press ”5” and then ”Enter” ⇦┘

After the last keying in of ”Enter” all values have been registered in the computer.

6.1.3 Programming of Filter Values (Suppression of Signal)

In the following is shown an example of programming of values matching most products.

To get access to the programming, start with entering the password.



The display shows the following text: - - Ind

Enter “Arrow down” ⇩

The display shows the following text: - - FIL (Display Filter Settings)

Enter ”Arrow left” ⇦

The display shows the following text: - - FIL 1 (Display Filter Band)

Enter ”Arrow left” ⇦

Press ”4” and then ”Enter” ⇦

The display shows the following text: - - FIL 2 (Display Filter Factor)

Enter ”Arrow left” ⇦

Press ”1” and then ”Enter” ⇦

The display shows the following text: - - FIL 3 (Zero Suppression)

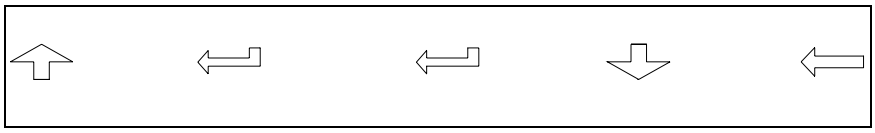
Enter ”Arrow left” ⇦

Press ”8” and then ”Enter” ⇦

After the last keying in of ”Enter” all filter values have been registered in the computer.

6.1.4 Calibration of the Scale

Enter the password.



Enter ”Arrow down” ⇩

The display shows the following text: -- Ind

Enter “Arrow down” ⇩ until

The display shows the following text: -- CAL (Calibration)

Enter “Arrow left” ⇦

The display shows the following text: --CAL 1 (Calibration the Instrument)

Enter “Arrow down” ⇩ until

The display shows the following text: --CAL 3 (Check and or Delete Calibration Points)

Previously encoded calibration values are erased by pressing “Arrow left” for min. 3 seconds ⇦ (min. 3 seconds = erase value)

To ensure that all calibration values are erased, press “Arrow left” again for min. 3 seconds ⇦ (min. 3 seconds = erase value)

If there is still a calibration value, once again press the "Arrow left" for min. 3 seconds.

When all values have been erased, one of the following display texts are shown on the display:

0

or --CAL 3

or Err 20

Press "Enter" ⏎ twice

The display shows the following text: --CAL 3 (Calibrating the Instrument)

Go to --CAL 1 (Calibrating the Instrument)

Enter "Arrow left" ⇦

The display shows the following text: - CP 1 - (Calibrating the zero point)

Enter "Arrow left" ⇦

The scale should be empty – then press "0"

and then "Enter' ⏎

The display shows the following text: - CP 2 - (Calibration point 2)

Enter "Arrow left" ⇦

Load the scale with a known weight and encode this weight.

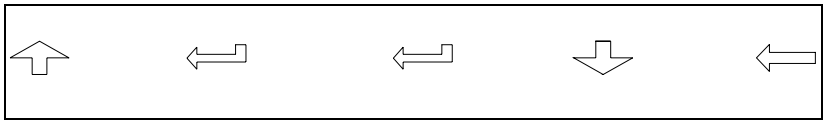
Then press "Enter" ⏎

The scale has now been calibrated. Press "Enter" until you reach the main menu.

6.1.5 Programming of Proportioning Parameters

In the following is shown an example of programming of values matching most products.

To get access to altering data enter the password



Enter "Arrow down" ⇩

The display shows the following text: - - Ind

Enter "Arrow down" ⇩

The display shows the following text: -- FIL

Enter "Arrow down" ⇩

The display shows the following text: - - CAL (Calibration - if the scale should calibrated we refer to the manual of the computer)

Enter "Arrow down" ⇩

The display shows the following text: -- dAC (Programming of analog signals, should not be used)

Enter "Arrow down" ⇩

The display shows the following text: -- dAr (Display configuration)

Enter "Arrow down" ⇩

The display shows the following text: --CFG 1 (Stabilization time)

Enter "Arrow left" ⇦

Press "0" and then "Enter" ⇦

The display shows the following text: --CFG 2 (Positive or negative weighing)

Enter "Arrow left" ⇦

Press "1" and then "Enter" ⇦

The display shows the following text: --CFG 3 (Nett or gross weighing)

Enter "Arrow left" ⇦

Press "1" and then "Enter" ⇦

The display shows the following text: --CFG 4 (Value for compensation of kinetic energy after coarse proportioning)

Enter "Arrow left" ⇦

Press "225" and then "Enter" ⇦

The display shows the following text: --CFG 5 (Correction factor)

Enter "Arrow left" ⇦

Press ”1” and then ”Enter” ⏎

The display shows the following text: --CFG 6 (Waiting time after proportioning mS)

Enter ”Arrow left” ⇦

Press ”4000” and then ”Enter” ⏎

The display shows the following text: --CFG 7 (view time for display mS)

Enter ”Arrow left” ⇦

Encode ”4000” and then ”Enter” ⏎

The display shows the following text: --CFG 8 (Time for delayed coarse proportioning after start signal mS)

Enter ”Arrow left” ⇦

Press ”50” and then ”Enter” ⏎

The display shows the following text: --CFG 9 (Time for delayed fine proportioning after start signal)

Enter ”Arrow left” ⇦

Press ”200” and then ”Enter” ⏎

After the last keying in of ”Enter” all parameters for proportioning have been programmed.

6.1.6 Programming of Weighing Quantity Required

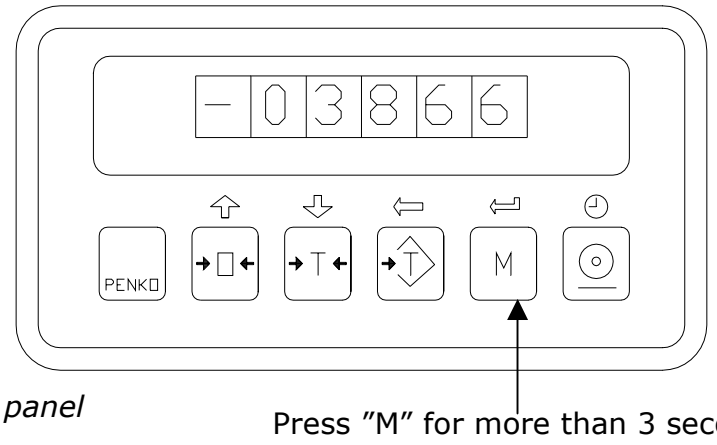


Fig. 8. Control panel

When programming the quantity you want to weigh, press the ”M”-key briefly, and the display starts flashing. Then the quantity you want to weigh is programmed. If you e.g. want 50 kg, encode 50000, and end up with “Enter” (if you have chosen decimals in ”decimal point position ind 6”, key in 50).

To have an accurate weighing, the quantity when the fine proportioning auger is operating be programmed. If you e.g. require 47 kg with both augers and 3 kg with the fine proportioning auger proportioning alone, the 3 kg should be programmed. This point is called the “switch over” point, and it takes place in continuation of the programming of the required weighed quantity. When the required total quantity has been programmed and finalized by enter, press the “M”-key again for min. 3 seconds. The display shows “dS1”. Press “arrow left” and then 3000 (or 3 if you have chosen decimals, and the indicated value is in kg). End up with 2 x enter.

Then carry out 5 test weighings that are controlled on an accurate scale, and calculate the average weight. This weight will normally deviate slightly from the required quantity, as a certain quantity of material will be floating in the air when the fine proportioning auger is stopped by the computer. To compensate for this quantity, the correction factor, by which the programmed quantity should be adjusted, should be calculated. If the average of these test weighings is lower than the value required the required weight should be adjusted upwards correspondingly.

Example:

50000 g have been programmed being the weight required.
In average 49750 g are weighed.
I.e. 250 g per weighing is missing.
Therefore program the corrected required weight being 50250 g.

If the quantity weighed is higher than the required one, the required weight should be adjusted downwards by the quantity that has been weighed too much.

During the test weighing you should also check that the ”switch over point” has been programmed in a way that the fine proportioning auger operates alone during the last time of proportioning. If the “switch over point” is programmed so that the time becomes too long, the weighing time will be longer than necessary.

6.2.0 Alarm Texts

Input value too large

Dead load instable

Overflow "CAL4". The shift is too large (it was larger than 32,000 internal parts)

ADC underflow

ADC overflow

No calibration points available

Resolution too low for calibration segment 1.

Resolution too low for the calibration segments indicated by the last digit of this error message

Resolution too low for calibration segment 4

No calibration points left or CAL. point is not existing

After changing the step size. Resolution too low for calibration segment 1

After changing the step size and recalculation the resolution is too low for the calibration segments indicated by the last digit of this error message

After changing the step size. Resolution too low for calibration segment 4

No proper calibration available

Underflow

Overflow

Display overflow

Press the "M" button to proceed

6.3.0 Starting up

Before the sack weighing scale is taken into use, check:

- If there are foreign bodies in the auger troughs and the machines with connection to the scale.

- If the bolts have been tightened.

The power is turned on:

- Do the augers run in correct direction?

7.0.0 USER'S MANUAL

7.1.0 Field of Application

The sack weighing scale is used for weighing of dry materials as grain, meal and pelleted materials. If you want to use the scale for other materials / fields, please contact the manufacturer before doing so, as otherwise the guarantee will become void.

7.2.0 Operation

During weighing you should try to keep so much material in the proportioning bin that the auger threads are covered. If you fill material into an empty silo during weighing, it may occur that material passes through the auger threads forming a cloud of dust, just as the weighing may be inaccurate.

At weighing out an empty sack is placed on the weighing platform, and a foot pedal is activated, giving start signal to the 2 proportioning augers. To achieve a good weighing accuracy, the large auger stops before the weight required has been reached, and the fine proportioning auger continues until the correct quantity has been reached.

When weighing place an empty sack on the weighing platform and activate the foot pedal giving start signal to the two proportioning augers. To achieve a good weighing accuracy, stop the large auger before the weight required is reached, and the fine proportioning auger continues until the correct quantity is reached.

It is important that the sack and weighing platform is not touched during weighing.

As the material falls from the augers into the sack, the inertia of the falling material will affect the load cell so that the material weighs less when it is in the sack. It is therefore quite normal that the value that is programmed as required quantity should be programmed to be higher than the quantity required. Therefore carry out some test weighings to find the value to be corrected.

Furthermore see the chapter "Programming of the Computer", especially chapter "Programming of Proportioning Parameters".

8.0.0 MAINTENANCE

8.1.0 Mechanical

The weighing scale is constructed in a way that it requires minimum maintenance. All bearings are lifetime-greased.

After 1 month of operation:

- Check bolts and nuts and retighten if necessary.

Then check:

Each month:

- Check bearings.
- Clean motors and electrical controllers for dust and moisture.
- Remove possible accumulations in trough as well as in- and outlets.
- Check wear of threads, pipes and clamps.

8.2.0 Cleaning

All cleaning should take place in a way that no dust clouds with danger of explosion are generated. Pressure air should therefore not be used. Instead use broom and vacuum cleaner.

To ensure necessary cooling and thereby decrease the risk of fire, the motor and gear should be kept free of dust.

If the auger is not used for a long time, check trough as well as in- and outlets for accumulations and impurities.

9.0.0 FAULT FINDING

9.1.0 Mechanical Faults

FAULT	REASON	REMEDY
Augers do not start	Fuse blown	Clean augers and replace fuse. If the fuse is blown again, contact electrician
	Thermal relay released	Clean augers and connect thermal relay
	Motor seized up	Contact electrician
Augers stop after a short time, and thermal relay releases	Motor incorrectly connected, or thermal relay incorrectly set	Check connection of motor and check that the thermal relay has been set according to motor
	Motor runs in wrong direction of rotation	Turn direction of rotation of both augers
	Impurities or wet material blocks the auger	Clean auger
Augers operate, but no material arrives	Blocking above the auger threads	Clean augers, check if material is moist. If the problem continues, a silo vibrator may be mounted. I silo vibrator has already been mounted, the time is altered, so that the vibrator vibrates for approx. 4 seconds each time proportioning starts

9.2.0 Faults in Weighing

FAULT	REASON	REMEDY
The quantity weighed has the same deviation each time	You have not corrected for the material moving when it hits the sack	Correct according to chapter "Programming of Proportioning Parameters"
Too large deviations in weighed quantity	The weighing platform cannot move freely	Clean around the weighing platform and check that it does not hit foreign bodies Manually correct for contents of the sack
	Sack or weighing platform is touched during weighing	Place sack accurately, possibly move weighing platform
	Coarse proportioning auger operates too long	Program the "switch over point" to a longer time, see chapter "Programming of Proportioning Parameters"
The balance is unstable	Programming values do not fit the required parameters for weighing	Program a lower value for "Ind2" and for "IndA", see chapter "Programming of the Computer"
	Load cell defective	Replace load cell

10.0.0 DISMANTLING THE WEIGHING SCALE

Dismantling of the weighing scale takes place in reverse order as mounting, and the same tools are to be used, see chapter "Necessary Mounting Tools".

We cannot recommend use of angle grinder or cutting torch – this should only take place when all safety rules are obtained. Beyond normal safety rules, the weighing scale should be cleaned for inflammable material and should be outside environments with fire or explosion hazard.

Disposal of the weighing scale can take place in containers for scrap iron. The control panel should, however, be disposed of in containers for electronic parts.

11.0.0 TECHNICAL SPECIFICATIONS

11.1.0 Dimensional Sketch

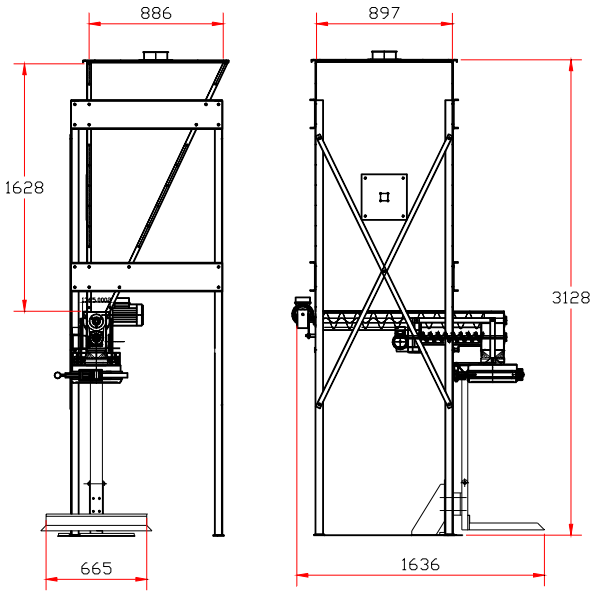


Fig. 9. Dimensional sketch

11.2.0 Technical Data

Volume of proportioning bin	700 litres
Motor for fine proportioning	0.09 kW
Worm gearing for fine proportioning	i = 20
Motor for coarse proportioning	0.37 kW
Worm gearing for coarse proportioning	i = 15
Proportioning accuracy	Better than 1%

11.2.1 Noise Level

At normal production with material the weighing scale has a noise level of 72 dBA.

11.2.2 Capacity

The capacity of the weighing scale depends on the material to be weighed as well as sack size and how the sacks are moved from the weighing scale (sack conveyor or sack trolley, operation staff etc.). Normally the capacity will be approx. 3 tons/hour when 50 kg sacks are used.

12.0.0 EX-ZONE SPECIFICATION

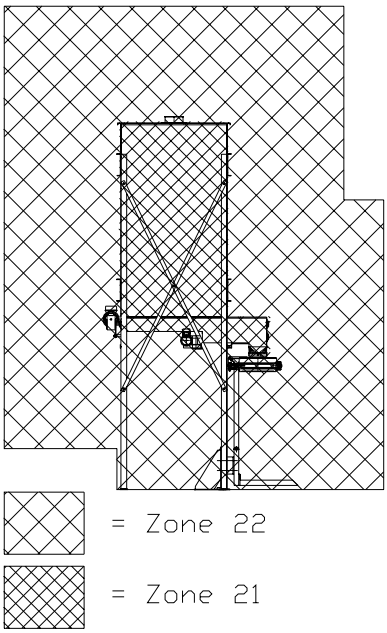


Fig. 10. Ex-zones

Ex-zones according to unified standards DS/EN 1127-1, DS/EN 50281-3, DS/EN 13463-1.

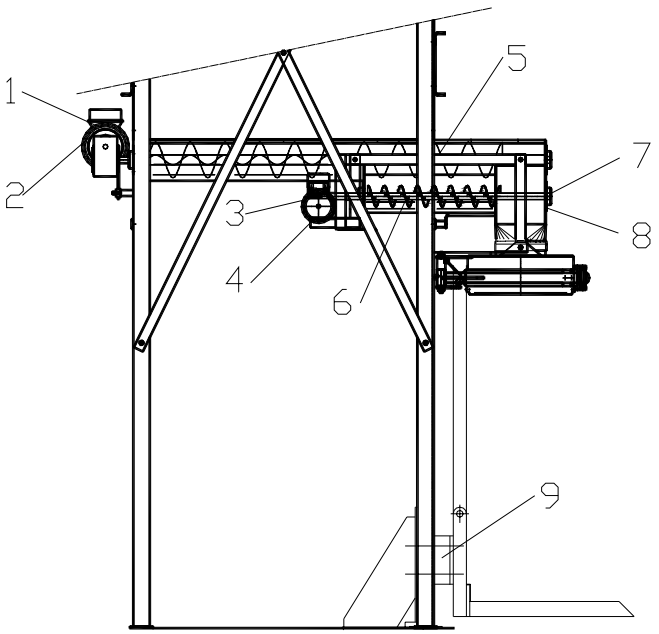
Around the proportioning bin and augers of the weighing scale and in a distance of min. 1 m to the extreme point is zone 22.

Inside the proportioning bin with augers is zone 21.

The weighing scale should be kept free of deposited dust that may be swirled around and form an atmosphere with risk of explosion.

If the weighing scale is placed close to other equipment with a zone stated to have larger danger of explosion and so that the zones are overlapping each other, the most important zone statement is valid in the overlapped area.

13.0.0 SPARE PARTS LIST



Pos	Item No.	Description
1	2340137	Motor 0.09 kW
2	2392056	Worm gearing i=20
3	2391037	Motor 0.37 kW
4	2391040	Worm gearing i=15
5	1501124	Auger shaft large
6	1501125	Auger shaft small
7	6404025	Ball bearing
8	6407087	Bearing housing
9	DT2800/200	Load cell

14.0.0 CONNECTING DIAGRAM

Connection of computer/load cell according to chapter ”Connection of the Computer”.

At connection of motors and possible vibrator, see the el-diagram delivered with the control panel.

15.0.0 CE/ATEX-DECLARATION OF CONFORMITY

The signer

SKIOLD A/S

Kjeldgaardsvej, 9300 Sæby, Danmark, tel. No. +45 99 89 88 87

hereby declares that:

Description	**Type**
Weighing scale	S100

is constructed for erection in ATEX-zone 22 and in conformity with the following directives:

Directive	**Standard**
CE/ATEX directives with updates	DS/EN 292-1 DS/EN 292-2 DS/EN 294-1 DS/EN 1127-1 DS/EN 13463-1 DS/EN 50281-1-1 DS/EN 50281-1-2 DS/EN 60204-1

Sæby, Denmark, 31.08.2006
Issue place and date

Samuel Waldorph
General Manager